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EXAMINER

TRAN, BINH X

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/518,013	<b>Applicant(s)</b> EGUCHI ET AL.	
	<b>Examiner</b> Binh X. Tran	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26, 28 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/14/2004</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of Species I in the reply filed on 10-16-2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claim 27 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10-16-2008.

### *Claim Objections*

3. Claims 6-8 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on any other multi dependent claim. See MPEP § 608.01(n). Accordingly, the claims 6-8 have not been further treated on the merits.

Claim 10 is objected to under 37 CFR 1.75(c) as being in improper form because it depends on improper multi dependent claim 9.

Claim 11 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on any other multi dependent claim. See MPEP § 608.01(n). Accordingly, the claim 11 not been further treated on the merits.

Claims 18-23 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on any other multi dependent claim.

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See MPEP § 608.01(n). Accordingly, the claims 18-23 have not been further treated on the merits.

Claim 24 is objected to under 37 CFR 1.75(c) as being in improper form because it depends on improper multi dependent claim 23.

Claims 25 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on any other multi dependent claim. See MPEP § 608.01(n). Accordingly, the claim 25 has not been further treated on the merits.

Claims 26 is objected to under 37 CFR 1.75(c) as being in improper form because it depends on improper multi dependent claim 25.

Claims 28 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on any other multi dependent claim. See MPEP § 608.01(n). Accordingly, the claim 28 has not been further treated on the merits.

Claims 29 is objected to under 37 CFR 1.75(c) as being in improper form because it depends on improper multi dependent claim 28.

4. Claims 6, 8 are objected to because of the following informalities:

In claims 6 and 17, the examiner suggests the applicants to spell out what the abbreviation "TMOS" stands for in order to avoid any confusion.

In claims 6, 17, the examiner suggests the applicants to spell out what the abbreviation "MTOS" stands for in order to avoid any confusion.

In claim 8, the examiner suggests the applicants to spell out what the abbreviation "TMP" stands for in order to avoid any confusion.

In claim 8, the examiner suggests the applicants to spell out what the abbreviation "TEP" stands for in order to avoid any confusion.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1, 9-11 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The oxygen-containing gas/or oxygen containing material is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). In claim 1, the applicants recite "a method for forming an oxide film on the surface of the substrate" (emphasis added). In order to form an "oxide film", an oxygen-containing gas or oxygen-containing material must be used. However, applicants fail to disclose the use of oxygen-containing gas or oxygen-containing material. It is not possible to form "an oxide film" without the present of oxygen-containing gas or oxygen-containing material.

Claims 9-11 are under 35 U.S.C. 112, first paragraph because they directly or indirectly depend on claim 1.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-26, 28-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1-5, the phrase "close to the atmospheric pressure" (emphasis added) is subjective, vague and indefinite. It is unclear from the claims what specific range of pressure that applicants wish to claim.

Regarding claims 6-8, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claims 6-8, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

In claim 6, the applicants recite "An oxide film forming method according to any of Claims 15-19". This is improper and indefinite because claims 15-19 all related to "an apparatus".

In claim 7, the applicants recite "An oxide film forming method according to any of Claims 15-20". This is improper and indefinite because claims 15-20 all related to "an apparatus".

In claim 8, the applicants recite "An oxide film forming method according to any of Claims 15-21". This is improper and indefinite because claims 15-21 all related to "an apparatus".

Claims 9-11 are indefinite because they directly or indirectly depend on indefinite claims as discussed above.

In claims 12-16, the phrase "close to the atmospheric pressure" (emphasis added) is subjective, vague and indefinite. It is unclear from the claims what specific range of pressure that applicants wish to claim.

Regarding claim 17-18, 21, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claims 17-18, 21, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim 22 recites the limitation "the distance" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 23 recites the limitation "the substrate place section" in line 2. There is insufficient antecedent basis for this limitation in the claim.

In claim 23 line 4, the phrase "can be" implied the possibility. Therefore, it is unclear from the claim that any limitation right after the phrase "can be" is required or not.

Claim 23 recites the limitation "said first mention gas emitting port" in line 8.

There is insufficient antecedent basis for this limitation in the claim.

Claims 17-26, 28-29 are indefinite because they directly or indirectly depend on indefinite claims as discussed above.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-7, 9-21, 25-26, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda (US 5,593,741) in view of Jain et al (US 6,465,044).

Respect to claim 1, Ikeda teaches a CVD method for forming an oxide film on the surface of the substrate comprising the steps of:



using a raw gas A (i.e. TEOS or TDEAS) and a reactive gas B (i.e. oxygen); discharged the oxygen gas (i.e. oxygen ions 114 and oxygen radicals 116) of the processing gases (See Fig 1, 17, Fig 3A-3B; col. 6);

joining the processing gas A not discharged (i.e. undecomposed TEOS 124) with said process gas B discharged processed in the vicinity of the surface of a substrate to mix them.

Respect to claim 12, Ikeda further discloses an apparatus having a gas supply source for supplying a process gases and a discharged section (See Fig 1, 17 and all paragraph associated with these Figures).

Claims 1 and 12 differ by further disclose the pressure is close to atmospheric pressure. Jain teaches to perform atmospheric pressure CVD to form silicon oxide (col. 4). Jain further discloses in increase in pressure would increase the deposition rate (col. 10 lines 43-50, Fig 6). It would have been obvious to one having ordinary skill in the art, at the time of invention, to perform CVD at atmospheric pressure because it helps to increase deposition rate.

Respect to claim 2 and 13, Ikeda further disclose to use H<sub>2</sub>O gas and react discharge oxygen with TEOS (gas A) and water in the vicinity of the substrate surface to mix them (col. 11 lines 25-65; Fig 11, col. 12 lines 1-25, col. 15 lines 55-60).

Respect to claim 3 and 14, Ikeda further discloses applying RF power connect to the electrode (26). When the RF power is applied, at least a portion of the H<sub>2</sub>O gas must be discharged along with the discharged oxygen (114, 116). Ikeda further discloses a portion of TEOS gas is not discharged (i.e. undecomposed TEOS 124).

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Respect to claims 4 and 15, as discussed above, since the RF power is applied, at least a portion of the TEOS gas (gas A), oxygen (gas B) and H<sub>2</sub>O must be discharged. Respect to claims 5 and 16, Ikeda teaches at least a portion the process gas is not discharged (See Fig 3a-36b). Therefore, the examiner interprets at least a portion of H<sub>2</sub>O gas is not discharged.

Respect to claims 6 and 17, Ikeda teaches the raw gas A is a silicon containing gas selected from the group consisting of tetraethylorthosilicate, tetramethylsilane, triethoxysilane, tetramethylcyclotetrasiloxane, octamethylcyclotetrasiloxane, hexamethyldisilazane, tris(dimethylamino)silane and tris(diethylamino)silane (col. 15 lines 50-54, read on applicant's silicon containing gas or the like). Respect to claims 7, 18, Ikeda discloses to use O<sub>2</sub> or N<sub>2</sub>O gas (See Fig 1, Fig 16-17).

Respect to claim 9, Ikeda teaches said joined gas forms a gas flow flowing along the surface to be processed of the substrate (See fig 3a-3b). Respect to claim 10, 25, Ikeda teaches an exhaust mechanism (i.e. vacuum pump section 62 and vacuum pump 64), exhaust control (using control 76) is carried out so that the joined gas forms a gas flow flowing along the surface of the substrate.

Respect to claim 11, Ikeda teaches to each components of the gas having a individual mass flow control (34, 38, 44, 48, 52) and the gas controller 82 to control all the gas flow rate (See Fig 1 and paragraph associated with Figure 1). Since, Ikeda teaches to use the controller to control the flow rate. It would have been obvious to one having ordinary skill in the art, at the time of invention, to perform routine experiment to have the same flow rate for the gas using the controller.

Respect to claims 17-18, it is noted that claims 17-20 drawn to an apparatus. According to the MPEP 2115, "Material or Article worked upon does not limit the apparatus claims. Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim". Claims 19-20, further disclose the manner of operating the apparatus. According to MPEP 2114, "Manner of operating the device does not differentiate apparatus claim from the prior art".

Respect to claim 21, Ikeda further disclose additional gas supply source for supply additional gas (See fig 1, 11, 16, 17). Since claim 21 is an apparatus claim, the examiner does not give any patentable weight regarding the specific gas composition of gas D (See discussion above under MPEP 2114-2115)

Respect to claim 26, Ikeda discloses the exhaust mechanism (vacuum pump 64) is arranged on the side closed to the plasma space on the side at a distance of a flow passage of the joined gas from a place where said reactive gas and raw gas are joined See Fig 1, 10-11, 16-17). Respect to claim 28, Ikeda teaches to provide a gas flow regulating plate (22) for forming a joining gas flow passage along the surface to be processed (col. 5 lines 6-15, Fig 1, 11, 16-17).

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda and Jain as applied to claims 1-7, 9-21, 25-26, 28 above, and further in view of Nguyen et al. (US 6,489,255).

Respect to claim 8, Ikeda and Jain fails to disclose supplying a phosphorus-containing gas and/or boron-containing gas. Nguyen teaches to supply a phosphorus

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containing gas include TMP or TEP, and boron-containing gas include TMB and TEB (See col. 4) in order to provide dopants to the layer. It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ikeda and Jain in view of Nguyen by providing phosphorus-containing gas and/or boron containing gas because it helps to provide dopants to the layer.

12. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda and Jain as applied to claims 1-7, 9-21 above, and further in view of Fonash et al. (US 2002/0094388).

Respect to claim 22, Ikeda fails to disclose a specific distance value between the discharged processing section and substrate place section. Fonash teaches the distance between the shower head (i.e. discharge section) and the sample stage was adjustable and set at 2 cm (20 mm; See paragraph 0034). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ikeda and Jain in view of Fonash by perform routine experimentation to obtain optimal distance because it has been held determination of workable range is not considered inventive.

13. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda and Jain as applied to claims 1-7, 9-21, 25-26, 28 above, and further in view of Bang et al. (US 6,110,556).

Respect to claim 29, Ikeda teaches to use a porous flow regulating plate (gas dispersion plate 22) and inert gas (helium) is emitted from the gas flow regulating plate (fig 1). However, Ikeda fails to disclose the gas flow regulating plate is ceramic. Bang teaches to use gas dispersion plate made of ceramic because it is capable of

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withstanding high temperature (col. 5 lines 57 to col. 6 lines 8). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ikeda and Jain in view of Bang by using ceramic porous gas flow regulating plate because it is capable of withstanding high temperature.

### ***Conclusion***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571) 272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Primary Examiner  
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/Binh X Tran/  
Primary Examiner, Art Unit 1792